

MONTHLY NOTICES

OF THE

ROYAL ASTRONOMICAL SOCIETY.

VOL. XXXII.

February 9, 1872.

No. 4

WILLIAM LASSELL, Esq., F.R.S., President, in the Chair.

Edward Henry Cooper, Esq., Markree Castle, Ireland;

J. Kennedy Esdaile, Esq., New University Club;

Isaac Engelson, Esq., Paris;

Capt John Herschel, F.R.S., India;

D. Lindsay Lowson, Esq., 164 Kennington Road;

John Martin, Esq., 72 Adelaide Square, South Shields;

Capt. H. O'Reilly, Queensland;

E. Roberts, Esq., 3 Union Place, Blackheath Road; and

George Wall, Esq., Colombo, Ceylon,

were balloted for and duly elected Fellows of the Society.

Report of the Council to the Fifty-second Annual General Meeting of the Society.

Progress and present state of the Society:—

| | Compounders. | Annual Contributors. | Non-residents. | Patrons, and Honorary. | Total Fellows. | Associates. | Grand Total. |
|--|--------------|----------------------|----------------|------------------------|----------------|-------------|--------------|
| December 31, 1870 | 192 | 305 | 10 | 3 | 510 | 44 | 554 |
| Error in last Report | -2 | ... | ... | ... | ... | ... | ... |
| Since elected ... | +6 | +20 | ... | ... | ... | ... | ... |
| Deceased ... | -6 | -8 | -1 | ... | ... | ... | ... |
| Removals ... | +2 | -2 | ... | ... | ... | ... | ... |
| Resigned ... | ... | -5 | ... | ... | ... | ... | ... |
| Expelled for non-payment of arrears, &c. ... | ... | -6 | ... | ... | ... | ... | ... |
| Dec. 31, 1871 ... | 192 | 304 | 9 | 3 | 508 | 44 | 552 |

Mr. Whitbread's Account as Treasurer of the R

RECEIPTS.

| 1871. | | | £ | s. | d. | £ | s. |
|--------|---|-----------|-----|----|----|-----|----|
| | Balance of last year's account | ... .. |  |  |  | 270 | 1 |
| Jan. 6 | By Dividend on £3400 Consols | ... .. | 50 | 3 | 0 | | |
| Apr. 6 | By ditto on £5000 New 3 per Cents | ... .. | 73 | 15 | 0 | | |
| July 6 | By ditto on £3400 Consols | ... .. | 49 | 14 | 6 | | |
| Oct. 6 | By ditto on £5200 New 3 per Cents | ... .. | 76 | 1 | 0 | | |
| | | | | | | 249 | 13 |
| | Received for arrears of contributions £210 11 | | 611 | 13 | 0 | | |
| | 192 annual contributions | ... 401 2 | | | | | |
| | Admission-fees | ... .. | 62 | 18 | 0 | | |
| | First years' contributions | ... .. | 39 | 16 | 0 | | |
| | | | | | | 714 | 7 |
| | 7 compositions | ... .. |  |  |  | 147 | 0 |
| | Sale of publications:— | | | | | | |
| | At the Rooms of the Society | ... .. | 5 | 11 | 6 | | |
| | By Messrs. Williams and Norgate | ... .. | 23 | 11 | 0 | | |
| | | | | | | 29 | 2 |

£1410 4

Astronomical Society, from January 1 to December 31, 1871.

EXPENDITURE.

| Salaries :— | | | | £ | s. | d. | £ | s. | d. |
|--|-----|-----|-----|-----|----|----|-------|----|----|
| Editor of Monthly Notices | ... | ... | ... | 60 | 0 | 0 | | | |
| Assistant Secretary | ... | ... | ... | 130 | 0 | 0 | | | |
| Commission on Collecting | ... | ... | ... | 36 | 0 | 0 | 226 | 0 | 0 |
| Taxes :— | | | | | | | | | |
| Land and Assessed | ... | ... | ... | 7 | 0 | 9 | | | |
| Income | ... | ... | ... | 1 | 17 | 8 | | | |
| Poor Rate | ... | ... | ... | 11 | 17 | 0 | | | |
| Other Parish Rates | ... | ... | ... | 5 | 9 | 8 | 26 | 5 | 1 |
| Bills :— | | | | | | | | | |
| Strangeways, printer | .. | ... | ... | 220 | 6 | 3 | | | |
| Rumfitt, bookbinder | ... | ... | ... | 17 | 12 | 7 | | | |
| Malby, engraver | ... | ... | ... | 6 | 15 | 0 | | | |
| Metcalf, ditto | ... | ... | ... | 12 | 5 | 0 | | | |
| Insurance | ... | ... | ... | 7 | 15 | 6 | | | |
| Mr. Williams, in aid of printing Chinese | | | | | | | | | |
| Observations of Comets | ... | ... | ... | 50 | 0 | 0 | | | |
| Grant in aid of Eclipse Expedition, 1870 | | | | 250 | 0 | 0 | 564 | 14 | 4 |
| Miscellaneous items :— | | | | | | | | | |
| House expenses | ... | ... | ... | 25 | 1 | 10 | | | |
| Stamps and postages | ... | ... | ... | 33 | 19 | 10 | | | |
| Books and parcels | ... | ... | ... | 7 | 3 | 0 | | | |
| Expenses of evening meetings | ... | ... | ... | 13 | 13 | 0 | | | |
| Waiters attending meetings | ... | ... | ... | 3 | 17 | 0 | | | |
| Coals and wood | ... | ... | ... | 12 | 0 | 0 | | | |
| Gas | ... | ... | ... | 8 | 2 | 11 | | | |
| Repairs | ... | ... | ... | 1 | 8 | 6 | | | |
| Sundries | ... | ... | ... | 23 | 19 | 1 | 129 | 5 | 2 |
| Mrs. Jackson Gwilt's annuity, 1 year | | | | | | | 8 | 16 | 0 |
| Investment :— | | | | | | | 955 | 0 | 7 |
| Purchase of £200 New 3 per Cents, 91½ | | | | | | | 183 | 10 | 0 |
| Balance at Banker's | | | | | | | 1138 | 10 | 7 |
| | | | | | | | 271 | 13 | 7 |
| | | | | | | | £1410 | 4 | 2 |

Examined and found correct, Jan. 25, 1872,

(Signed)

H. PERIGAL,
W. T. LYNN,
W. B. GIBBS,

Auditors.

1872MNRAS...32....93.

Assets and Present Property of the Society, January 1, 1872:—

| | £ | s. | d. | £ | s. | d. |
|--|-----|-----|-----|-----|----|----|
| Balance at Banker's | ... | ... | ... | 271 | 13 | 7 |
| 3 Contributions of 7 years' standing ... | 44 | 2 | 0 | | | |
| 5 " 6 " | 63 | 0 | 0 | | | |
| 12 " 5 " | 126 | 0 | 0 | | | |
| 2 " 4 " | 33 | 12 | 0 | | | |
| 9 " 3 " | 56 | 14 | 0 | | | |
| 9 " 2 " | 37 | 16 | 0 | | | |
| 51 " 1 " | 107 | 2 | 0 | | | |
| Balances of several Accounts | 19 | 2 | 0 | | | |
| | | | | 487 | 8 | 0 |
| Due for Publications | ... | ... | ... | 17 | 10 | 0 |
| £5200 New 3 Per Cents (including Mrs. Jackson Gwilt's Gift, £300). | | | | | | |
| £3400 Consols, including the Lee Fund (£100) and Turnor Fund (£500). | | | | | | |
| Unsold Publications of the Society. | | | | | | |
| Various astronomical instruments, books, prints, &c. | | | | | | |
| Balance of Turnor Fund (included in Treasurer's Account) | | | | 167 | 12 | 9 |

Stock of volumes of the *Memoirs*:—

| Vol. | Total. | Vol. | Total. | Vol. | Total. |
|-------------|--------|------------------|--------|------------------|--------|
| I. Part 1 | 11 | XIII. | 198 | XXVII. | 456 |
| I. Part 2 | 51 | XIV. | 390 | XXVIII. | 416 |
| II. Part 1 | 69 | XV. | 173 | XXIX. | 448 |
| II. Part 2 | 33 | XVI. | 198 | XXX. | 297 |
| III. Part 1 | 85 | XVII. | 181 | XXXI. | 173 |
| III. Part 2 | 104 | XVIII. | 176 | XXXII. | 204 |
| IV. Part 1 | 102 | XIX. | 183 | XXXIII. | 207 |
| IV. Part 2 | 104 | XX. | 179 | XXXIV. | 193 |
| V. | 124 | XXI. Part 1 | 216 | XXXV. | 167 |
| VI. | 150 | XXI. Part 2 | 100 | XXXVI. | 250 |
| VII. | 175 | XXI. (together). | 89 | (with M. N.) | |
| VIII. | 161 | XXII. | 182 | XXXVI. (without) | 35 |
| IX. | 164 | XXIII. | 176 | XXXVII. | 353 |
| X. | 174 | XXIV. | 182 | Part 1 | |
| XI. | 184 | XXV. | 196 | XXXVII. Part 2 | 402 |
| XII. | 189 | XXVI. | 200 | XXXVIII. | 438 |
| | | | | XXXIX. | 511 |
| | | | | Part 1 | |

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The instruments belonging to the Society are as follows :—

The *Harrison* clock,
 The *Owen* portable circle,
 The *Beaufoy* circle,
 The *Beaufoy* transit,
 The *Herschelian* 7-foot telescope,
 The *Greig* universal instrument,
 The *Smeaton* equatoreal,
 The *Cavendish* apparatus,
 The 7-foot Gregorian telescope (late Mr. Shearman's),
 The Variation transit (late Mr. Shearman's),
 The Universal quadrant by Abraham Sharp,
 The *Fuller* theodolite,
 The Standard scale,
 The *Beaufoy* clock, No. 1,
 The *Beaufoy* clock, No. 2,
 The *Wollaston* telescope,
 The *Lee* circle,
 The *Sharpe* reflecting circle,
 The *Brisbane* circle,
 The *Baker* universal equatoreal,
 The *Reade* transit.

The *Sheepshanks*' collection of instruments, viz.,—

1. 30-inch transit, by Simms, with level and two iron stands.
2. 6-inch transit theodolite, with circles divided on silver; reading microscopes, both for altitude and azimuth; cross and siding levels; magnetic needle; plumbline; portable clamping foot and tripod stand.
3. $4\frac{6}{10}$ -inch achromatic telescope, about 5 feet 6 inches focal length; finder, rack motion; double-image micrometer; object-glass micrometer; two other micrometers; one terrestrial and ten astronomical eyepieces, applied by means of two adapters, with equatorial stand and clock movement.
4. $3\frac{1}{4}$ -inch achromatic telescope, with equatorial stand; double-image micrometer; one terrestrial and three astronomical eyepieces.
5. $2\frac{1}{4}$ -inch achromatic telescope, with stand; one terrestrial and three astronomical eyepieces.
6. $2\frac{1}{4}$ -inch achromatic telescope, about 30 inches focus; one terrestrial and four astronomical eyepieces.
7. 2-foot navy telescope.
8. 45-inch transit instrument, with iron stand, and also Y's for fixing to stone piers; two axis levels.
9. Repeating theodolite, by Ertel, with folding tripod stand.
10. 8-inch pillar-sextant, divided on platinum, with counterpoise stand and horizon roof.
11. Portable zenith instrument, with detached micrometer and eyepiece.

12. 18-inch Borda's repeating circle, by Troughton.
13. 8-inch vertical repeating circle, with diagonal telescope, by Troughton and Simms.
14. A set of surveying instruments, consisting of a 12-inch theodolite for horizontal angles only, with extra pair of parallel plates; tripod staff, in which the telescope tube is packed; repeating table; level collimator, with micrometer eyepiece; and Troughton's levelling staff.
15. Level collimator, plain diaphragm.
16. 10-inch reflecting circle, by Troughton, with counterpoise stand; artificial horizon, with metallic roof; two tripod stands, one with table for artificial horizon.
17. Hassler's reflecting circle, by Troughton, with counterpoise stand.
18. 6-inch reflecting circle, by Troughton, with two counterpoise stands, one with artificial horizon.
19. 5-inch reflecting circle, by Lenoir.
20. Reflecting circle, by Jecker, of Paris.
21. Box sextant and 3-inch plane artificial horizon.
22. Prismatic compass.
23. Mountain barometer.
24. Prismatic compass.
25. 5-inch compass.
26. Dipping needle.
27. Intensity needle.
28. Ditto ditto.
29. Box of magnetic apparatus.
30. Hassler's reflecting circle, with artificial horizon roof.
31. Box sextant and $2\frac{1}{4}$ -inch glass plane artificial horizon.
32. Plane speculum artificial horizon and stand.
33. $2\frac{1}{2}$ -inch circular level horizon, by Dollond.
34. Artificial horizon roof and trough.
35. Set of drawing instruments, consisting of 6-inch circular protractor; common ditto; 2-foot plotting scale; two beam compasses and small T square.
36. A pentagraph.
37. A noddy.
38. A small Galilean telescope, with the object lens of rock-crystal.
39. Six levels, various.
40. 18-inch celestial globe.
41. Varley stand for telescope.
42. Thermometer.
43. Telescope, with the object-glass of rock crystal.

To these must be added the following instruments which had been employed in the Observations of the Total Solar Eclipse of 1870, and which, by a resolution of the joint Eclipse Committee of 1870, were transferred to the Royal Astronomical Society:—

Portable equatoreal stand,
 Portable altazimuth tripod,
 Four polarimeters,
 Two Biquartz and Nicol's prisms,
 Registering spectroscope, without prism,
 Camera and chemicals, in box,
 Two five-prism spectroscopes,
 Cradle for telescope,
 Eight-inch reflector and stand, with seven prisms,
 Spectroscope,
 A small box, containing —
 Three square-headed Nicol's prisms,
 Two Babinet's compensators,
 Two double-image prisms,
 Three Savarts,
 One positive eye-piece, with Nicol's prism,
 One dark wedge.

These are now in the apartments of the Society, with the exception of the following, which are lent, during the pleasure of the Council, to the several parties under mentioned, viz. :—

The *Fuller* theodolite, to the Director of the Sydney Observatory.

The *Beaufoy* transit, to the Observatory, Kingston, Canada.

The *Sheepshanks* instrument, No. 1, to Mr. Lassell.

Ditto ditto No. 2, to Mr. Huggins.

Ditto ditto No. 3, to Mr. Proctor.

Ditto ditto No. 4, to Rev. C. Lowndes.

Ditto ditto No. 5, to Mr. Birt.

Ditto ditto No. 6, to Rev. J. Cape.

Ditto ditto No. 8, to Rev. C. Pritchard.

Ditto ditto No. 9, to the Director of the Sydney Observatory.

Ditto ditto No. 41, to Rev. C. Pritchard.

Ditto ditto No. 43, to Mr. Huggins.

The 6-inch circular protractor, to Mr. Birt.

Lent on account of the Eclipse Expedition :—

Two polarimeters. Col. Tennant.

One ditto. Mr. Ranyard.

One ditto. B. A. Eclipse Committee.

One Biquartz and Nicol's prism. Col. Tennant.

One ditto ditto. Mr. Ranyard.

Registering spectroscope, no prism. Col. Tennant.

Camera and chemicals, in box. B. A. Eclipse Committee.

One five-prism spectroscope. B. A. Eclipse Committee.

One ditto. Mr. Lockyer.

The Gold Medal.

The Council have awarded the Gold Medal to Signor Schiaparelli for his researches on the connexion between the orbits of comets and meteors. At the close of the ordinary business the President will explain to the Society the reasons which guided the Council in awarding the Medal to Signor Schiaparelli.

New Bye-law relating to the Award of the Medal.

At a Special General Meeting of the Society, held after the business of the Ordinary Meeting in June was concluded, the following Bye-law was submitted to the Fellows, and unanimously adopted.

In Section XVI. add:—

“75*. Notwithstanding the preceding Bye-laws, in cases where two or more persons have been jointly concerned in the production of any scientific treatise, or the carrying out of any research, work, or discovery, or have been the simultaneous but independent authors of any such treatise, work, research, or discovery, the Council may, under these circumstances, receive the nomination of such two or more persons as joint recipients of the Medal, and proceed thereupon in like manner as above mentioned with respect to the names of separate persons; and should the Medal be ultimately awarded to such joint authors, workers, or discoverers, an impression of the Medal shall be provided for and given to each of such joint recipients.”

The Council have for some years past felt the importance of possessing the power to award a joint Medal when original researches have been performed by two or more persons, either when working conjointly, or when independent investigations on the same subject have been made. They are glad therefore to find that this feeling is also shared by the Fellows generally.

PRINTED TRANSACTIONS OF THE SOCIETY.

Memoirs.

Part I. of Volume XXXIX. of the *Memoirs* has been published since the last Report. This Part contains a memoir by Professor Cayley “On the Graphical Construction of a Solar Eclipse,” with an illustrative plate.

Many of the communications now printed in the *Monthly Notices* would, in former years, have been included in the *Memoirs*. This alteration in the manner of printing is generally both advantageous to the Author and the Fellows by the more rapid publication and distribution of matters of interest. A few of the subjects which have been before the Society, with others which bear upon the progress of Astronomy, are referred to in another section of the Report.

General Index to the Memoirs.

The Index to the *Monthly Notices* has been found so useful and acceptable to the Fellows, that the Council gave instructions to the Assistant-Secretary to prepare a General Index to the *Memoirs*, uniform with the Index to the *Monthly Notices*, including all the titles of Papers and the names of the authors contained in Volumes I.-XXXVIII. The work was completed by Mr. Williams during the recess, and placed in the hands of the Fellows in November last. The two Indexes thus form a complete catalogue of the numerous contributions towards the progress of our science which have been laid before the Society from its foundation to the present time.

OBITUARY.

The Council have to deplore the loss by death of a long list of Fellows, several of whom were distinguished astronomers and former officers of the Society. Sir John Herschel and Mr. Babbage were the last survivors of the small band of scientific men who met together at the Freemasons' Tavern on January 12th, 1820, "to take into consideration the propriety and expediency of establishing a Society for the encouragement and promotion of astronomy," a meeting which resulted in the foundation of the Royal Astronomical Society. The following list contains the names of the deceased Fellows:—

Fellows :— Charles Babbage, Esq., F.R.S.
 Capt. J. Palladio Basevi, R.E.
 Rev. A. W. Deey.
 Augustus De Morgan, Esq.
 Lt.-Gen. Sir W. T. Denison, K.C.B., F.R.S.
 Earl of Dunraven, F.R.S.
 Capt. R. W. H. Hardy, R.N.
 Sir J. F. W. Herschel, Bart., F.R.S.
 Sir A. Lang.
 Sir Roderick I. Murchison, Bart, K.C.B., F.R.S.
 Admiral Sir William Ramsay, K.C.B.
 William Rutherford, Esq., LL.D.
 Charles E. Smith, Esq.
 Capt. David Smith.
 Rev. William Taylor, F.R.S.
 Rev. T. W. Weare.

CHARLES BABPAGE was born on St. Stephen's day, 26th December, 1792, and died on 18th October, 1871, aged nearly seventy-nine years. His parents were of good standing in the middle class. His early education, which commenced at five years, was conducted at various private schools, whence, after a